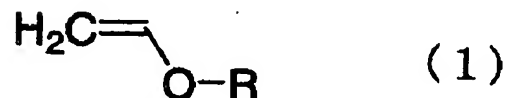


Replaced by  
Art. 19

# CLAIMS

1. A fluorine-containing vinyl ether represented by the formula 1,



wherein R represents an organic group comprising at least one  
5 fluorine atom and a cyclic structure.

2. A fluorine-containing vinyl ether according to claim 1, wherein the organic group comprises:

(a) the cyclic structure that is selected from the group consisting of  
10 cyclopentane ring, cyclohexane ring, norbornene ring, aromatic rings, tricyclodecane ring; and

(b) at least one substituent that is selected from the group consisting of  $(-\text{OH})_m$ ,  $(-\text{R}^1)_n$ , and  $-\text{COOR}^4$

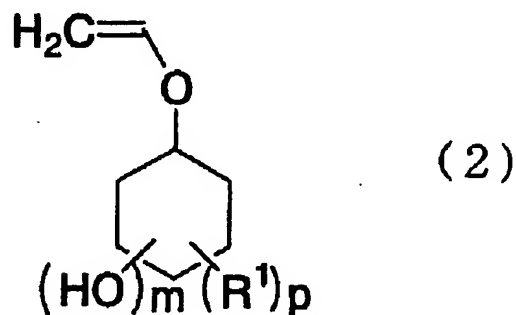
where  $\text{R}^1$  is at least one substituent selected from the group consisting  
15 of  $-\text{F}$ ,  $-\text{CF}_3$ , and  $-\text{R}^2\text{C}(\text{CF}_3)_2\text{OR}^3$ , where  $\text{R}^2$  is  $\text{CH}_2$  or  $\text{C}_2\text{H}_4$ , and  $\text{R}^3$  is H or an acid-labile protecting group,

$\text{R}^4$  is H, a  $\text{C}_1\text{-C}_{15}$  alkyl group, or a  $\text{C}_1\text{-C}_{15}$  substituent containing an ether bond, and

m is 0 or 1, and n is an integer of 1-8.

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3. A fluorine-containing vinyl ether according to claim 1 or 2, which is represented by the formula 2,

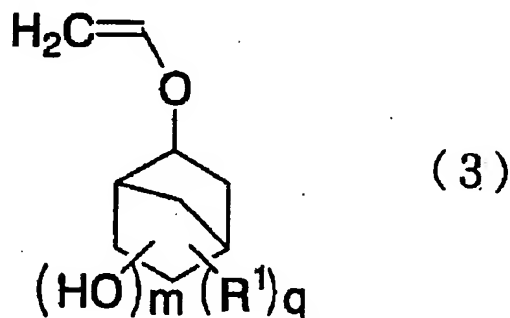


where  $R^1$  is at least one substituent selected from the group consisting of  $-F$ ,  $-CF_3$ , and  $-R^2C(CF_3)_2OR^3$ , where  $R^2$  is  $CH_2$  or  $C_2H_4$ , and  $R^3$  is  $H$  or an acid-labile protecting group, and

$p$  is an integer of 1-5, and  $m$  is 0 or 1.

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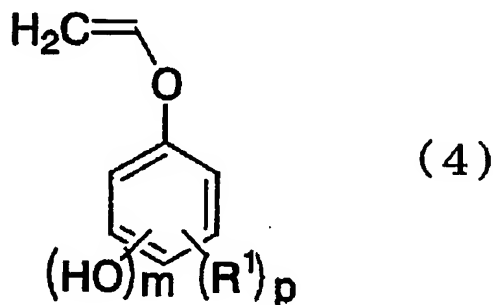
4. A fluorine-containing vinyl ether according to claim 1 or 2, which is represented by the formula 3,



where  $R^1$  is at least one substituent selected from the group consisting of  $-F$ ,  $-CF_3$ , and  $-R^2C(CF_3)_2OR^3$ , where  $R^2$  is  $CH_2$  or  $C_2H_4$ , and  $R^3$  is  $H$  or an acid-labile protecting group, and

$q$  is an integer of 1-4, and  $m$  is 0 or 1.

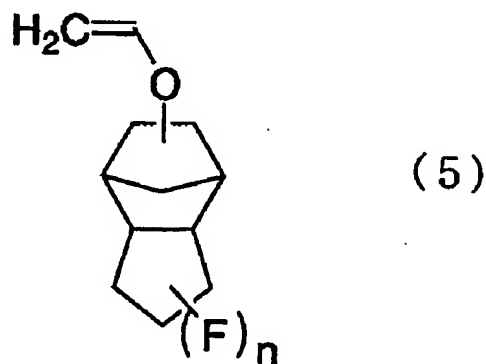
5. A fluorine-containing vinyl ether according to claim 1 or 2, which is represented by the formula 4,



where  $R^1$  is at least one substituent selected from the group consisting of  $-F$ ,  $-CF_3$ , and  $-R^2C(CF_3)_2OR^3$ , where  $R^2$  is  $CH_2$  or  $C_2H_4$ , and  $R^3$  is  $H$  or an acid-labile protecting group, and

p is an integer of 1-5, and m is 0 or 1.

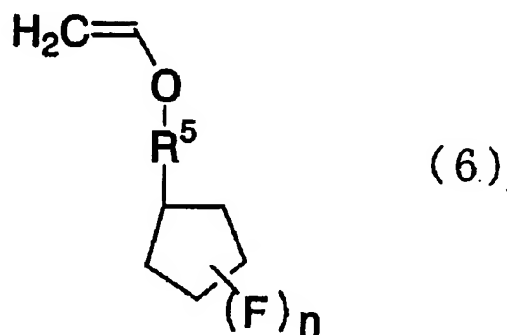
6. A fluorine-containing vinyl ether according to claim 1 or 2, which is represented by the formula 5,



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where n is an integer of 1-8.

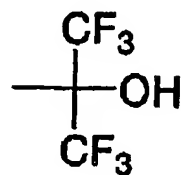
7. A fluorine-containing vinyl ether according to claim 1 or 2, which is represented by the formula 6,



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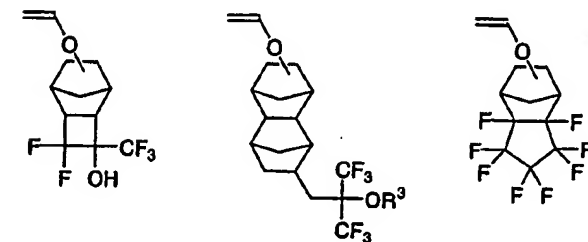
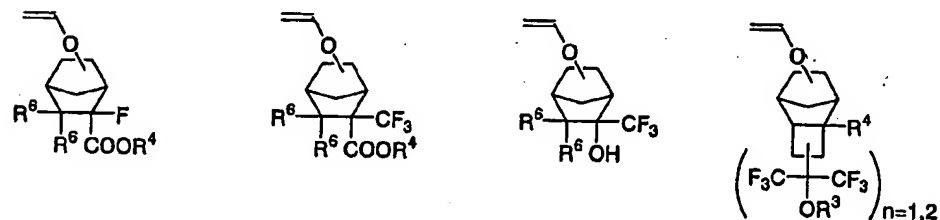
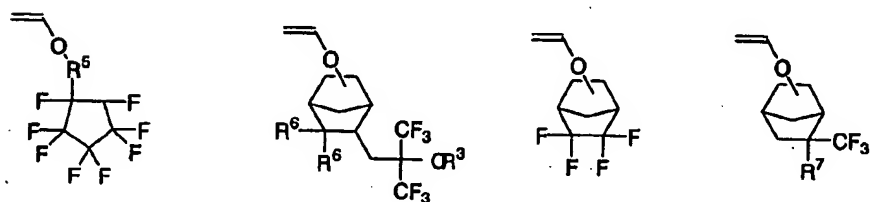
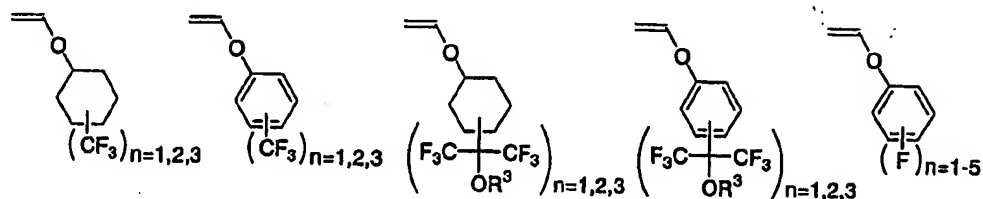
where R<sup>5</sup> is a C<sub>0</sub>-C<sub>5</sub> alkyl group, and n is an integer of 1-8.

8. A fluorine-containing vinyl ether according to claim 1 or 2, which comprises a hexafluoroisopropanol unit represented by the formula 7,



(7).

9. A fluorine-containing vinyl ether according to claim 1 or 2, which is represented by one of the following formulas:



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where  $R^3$  is H or an acid-labile protecting group;

$R^4$  is H, a  $C_1$ - $C_{15}$  alkyl group, or a  $C_1$ - $C_{15}$  substituent having an ether bond;

$R^5$  is a  $C_0$ - $C_5$  alkyl group;

$R^6$  is H or F; and

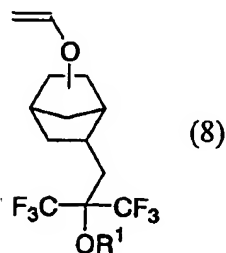
$R^7$  is  $CF_3$ , OH,  $CO_2H$ ,  $CO_2R^8$ , or  $OCOR^8$  where  $R^8$  is  $C_1$ - $C_{15}$  alkyl group.

5

10. A fluorine-containing polymer comprising a unit derived from a fluorine-containing vinyl ether according to claim 1 or 2.

11. A resist composition comprising a fluorine-containing polymer  
10 according to claim 10.

12. A fluorine-containing copolymer comprising:  
a first unit derived from a first monomer that is a fluorine-containing vinyl ether represented by the formula 8:



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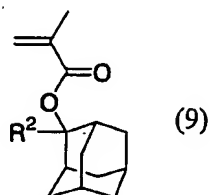
where  $R^1$  is  $-H$  or a  $C_1$ - $C_8$  alkyl group that optionally contains an oxygen atom; and

a second unit derived from a second monomer that is at least one selected from the group consisting of acrylic esters and methacrylic esters.

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13. A fluorine-containing copolymer according to claim 12, wherein the second monomer contains an acid-labile protecting group.

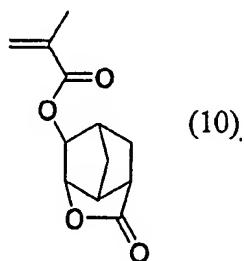
14. A fluorine-containing copolymer according to claim 12 or 13, wherein  
25 the second monomer is a first methacrylic ester represented by the general formula 9:



where  $R^2$  is  $-\text{CH}_3$  or  $-\text{CH}_2\text{CH}_3$ .

15. A fluorine-containing copolymer according to claim 12, wherein the second monomer is an acrylic or methacrylic ester comprising a lactone ring.

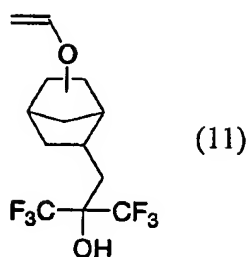
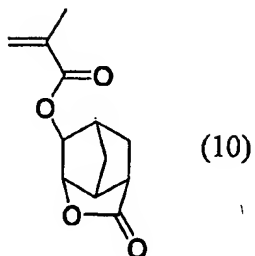
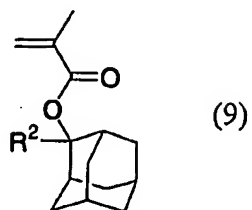
16. A fluorine-containing copolymer according to claim 12 or 15, wherein the second monomer is a second methacrylic ester represented by the formula 10:



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17. A fluorine-containing copolymer according to claim 12, wherein the second monomer is a combination of first and second methacrylic esters represented by the formulas 9 and 10, and

15 wherein the fluorine-containing vinyl ether is represented by the formula 11,



where  $R^2$  is  $-\text{CH}_3$  or  $-\text{CH}_2\text{CH}_3$ .

18. A resist composition comprising a fluorine-containing copolymer  
5 according to claim 12 or 13.